

# 第 1608 回 天文学教室談話会

2016 年 11 月 8 日 (火) 16:30 より

東京大学理学部 1 号館西棟 11 階 1109 号室 (天文学専攻会議室) にて

“Herschel and ALMA findings of supernovae—dust, molecules and  
nuclear synthesis”

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Supernovae (SNe) play a crucial role in the chemical evolution of galaxies by enriching their interstellar media (ISM) with heavy elements and dust.

The formation of dust in core-collapse supernovae (SNe) is one of the unresolved issues in the chemical and physical evolution of supernovae. I will present Herschel Space Observatory’s discovery of a large dust reservoir in SN 1987A, Cassiopeia A and the Crab Nebula. The estimated dust mass is 0.1–1 solar masses, which are typically 1000 times higher than previously thought. A significant fraction of the elements synthesized by the supernova can condense into dust grains. That suggests that SNe can be important source of dust in ISM of galaxies.

With ALMA, we discovered CO, SiO, HCO<sup>+</sup> and SO lines in SN 1987A. The observations can probe insight of molecular chemistry, leading dust formation in SNe. In millimetre wavelength, isotopologue lines appear at separated wavelengths, enabling constraining isotope ratios of <sup>28</sup>Si/<sup>29</sup>Si and <sup>28</sup>Si/<sup>30</sup>Si. ALMA can provide crucial limit on nuclear synthesis in high mass stars and supernovae.